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Integration of functional liquids in solid-state electronic circuits

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Field-effect gating with solid dielectrics is the basis of modern electronics. It is a technique that is most successfully used in integrated circuits. Here, we present our work on realizing solid-state heterostructures with fully integrated liquids, opening a brand new phase-space of materials for integrated circuits. Gating with liquid electrolytes in field-effect transistors offers clean contact-electrolyte interfaces and higher polarizations than in conventional, all-solid-state architectures. We demonstrate the fabrication of electronic devices such as capacitors and field-effect transistors with integrated, patterned aqueous-NaCl solutions, which are of equal quality or even outperform standard, bulk electrolyte devices. Our work opens a new route to the exploitation of solid–liquid interfaces in integrated functional devices.

Biography

E Fillis Tsirakis completed his studies in Max Planck Institute for Solid State Research, Germany.

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